EVALUATION OF TEOM DATA

Purpose

This Air Quality Group procedure describes the steps to evaluate the TEOM field data for acceptance, qualification, or rejection.

Scope

This procedure applies to the validation and verification of field data collected by the TEOM.

In this procedure

This procedure addresses the following major topics:

Hazard Control Plan

The hazard evaluation associated with this work is documented in HCP-ESH-17-Office Work.

Signatures

Prepared by: Alice Baumann, ESH-17	Date: 1/02/2002
Approved by: Craig Eberhart, Air Quality Monitoring Project Leader	Date: 1/8/2002
Approved by: Terry Morgan, QA Officer	Date: 1/9/2002
Work authorized by: Jean Dewart, ESH-17 Acting Group Leader	Date: 1/9/02

02/19/02

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	TEOM Field Data Validation and Verification Database Inspection	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	2/4/02	New document.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- Personnel assigned to evaluate TEOM data

Training method

The training method for this procedure is **self-study** (reading) and is documented in accordance with the procedure for training (ESH-17-024).

Definitions specific to this procedure

TEOM: Tapered Element Oscillating Microbalance – an instrument designed to give real-time mass concentrations of particulate collected when ambient air is drawn through a filter that is continuously weighed.

References

The following documents are referenced in this procedure:

- ESH-17-024, “Personnel Training”

Note

Actions specified within this procedure, unless preceded with “should” or “may,” are to be considered mandatory guidance (i.e., “shall”).

Checking and Evaluating TEOM Data

Evaluating data

In addition to particulate data requested by the project leader, instrument function parameters are collected and may include main flow rate, auxiliary flow rate, instrument status, percent filter loading, noise, etc. Use the TEOM Field Data Validation and Verification Database Inspection checklist (Attachment 1) to document the checks performed.

Steps to check the data

To check the data, perform the following steps:
Note: These steps may be performed in slightly different order.

Step	Action
1	Open the TEOM database using MS Access and click on the tab "Data Collection."
2	Select "View or Edit TEOM Unchecked VV data" and then click "Open Form."
3	Sort by date and time (if not already sorted, select both the date and time columns and then sort) and ensure cells are not empty. Check that the dates appear correct and the times are *standard* time (not daylight savings).
4	While sorted by date and time, look over mass concentrations. If these begin to vary more than usual, go to the TEOM and check temperatures, vibrations, noise, flow rates, etc. Make a note in the comments section.
5	Ensure fields are not null. If fields of interest or critical data points are missing, reject them in the column recording qualification of data.
6	Be sure the sampler ID is listed.
7	Be sure the sampler's location is listed.
8	Look for values in the "Status" column not equal to zero. You may do this easily by selecting the column and sorting in descending order. • Zeros indicate that the instrument was operating normally. • Ones in this column indicate a problem with the mass transducer. The control unit may not be receiving a frequency signal. • Twos indicate temperature is outside of operational bounds (±0.1 °C). The temps may be for the air, cap, and/or case. • Threes indicate flows outside of operational bounds (± 0.1 l/min). • Fours show that the filter load is nearing capacity. • There may be summations of any of the above numbers. If anything other than zero is displayed in the status column, qualify or reject these data points in the "Qual" column. Use best professional judgement.

Steps continued on next page.

Checking and Evaluating TEOM Data, continued

Step	Action
9	Click in the "30-min Avg" and arrange in ascending order. Negative numbers far from zero (e.g., less than -2) are not accurate. Qualify or reject those data. Reject null entries. Zeroes are acceptable.
10	Repeat the step above for the "24 Hr Avg MC" column. Negative values for this parameter are more significant than for the 30-min average.
11	Look at the column of data recording Auxiliary Flow ("Aux"). In general, these numbers should be within 1 lpm of 13.7 lpm. If outside this limit, reject the data point by placing a R in the "Qual" column.
12	Look at main flow values. These should be within 0.1 lpm of 3.0 lpm.
13	Check the logbook for information that may be pertinent for the data collected. Record it in the comments field.
14	Complete the form "TEOM Field Data Validation and Verification Database Inspection" (Attachment 1) to document the validation and verification of the data.
15	When validation, verification, and qualification of data are complete, click on "Records Checked." This will move data into the "Final Data" table.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted **annually** as records to the records coordinator:

- TEOM Field Data Validation and Verification Database Inspection

Air Quality Group

TEOM Field Data Validation and Verification Database Inspection

This form is from ESH-17-245

11/26/01 version

TEOM Start and End Dates of Data Collected: _____

TEOM Sampler ID: _____ TEOM Location: _____

Data Element Inspected	Complete in Access Field Sampling database	Comments	Within expected range, appear normal *or qualified*	Expected range
FIELD DATA READY FOR V&V				
Date (no null fields, readable format, consistent with collection dates, etc)	Y - N - NA		Y - N - NA	Month, day and year
Time (no null fields, MST, consistent with collection times, etc)	Y - N - NA		Y - N - NA	00:00:00 to 24:59:59
TEOM Sampler ID	Y - N - NA		Y - N - NA	
30-Minute Average Data (no null fields, look for negative numbers)	Y - N - NA		Y - N - NA	
24 Hr Avg MC (no null fields, look for negative numbers)	Y - N - NA		Y - N - NA	---
Total Mass	Y - N - NA		Y - N - NA	Not negative
Status Normal?	Y - N - NA		Y - N	0 - Normal > 0 - Abnormal
Filter Loading	Y - N - NA		Y - N - NA	1-100%
Comments included	Y - N - NA		NA	---
Auxiliary Flow	Y - N - NA		Y - N - NA	Within 1 liter of 13.7 liters
Mass Concentration fairly consistent?	Y - N - NA		Y - N - NA	---
Main Flow	Y - N		Y - N - NA	3 LPM +- 0.1
Data Qualifiers in use	Y - N		NA	Q or R
Field logbook entries in database?	Y – N - NA		NA	---
Move to Final Data table	Y – N			---

Verified by:

_____ _____ _____

Signature Name (print) Date